Preventing the next Pandemic: Vaccine Diplomacy in a time of Anti-Science

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### Under 5 Child Deaths 2000-2017

**GBD 2017**

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<thead>
<tr>
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<th>2000</th>
<th>2017</th>
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<tr>
<td>Measles</td>
<td>478,727</td>
<td>83,438 (-83%)</td>
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<td>Pertussis</td>
<td>138,048</td>
<td>86,091 (-38%)</td>
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<td>Tetanus</td>
<td>105,333</td>
<td>18,623 (-82%)</td>
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<td>H. flu</td>
<td>86,104</td>
<td>36,185 (-58%)</td>
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<td>Diphtheria</td>
<td>10,413</td>
<td>2,914 (-72%)</td>
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Sebastiao Salgado
Incidence of Hib in USA
Global Elimination of Polio & Measles

- 1988
- 2018

- Countries that have never eliminated polio
- Countries that have eliminated polio
- Data not available

Polio elimination status as of 1988 is based on multiple sources, because the quality and methods of data collection varied widely at that time. Current boundaries are shown on both maps. Boundaries shown do not imply the expression of any opinion concerning the legal status of any country or territory.

Average Number Infected Per Case

- Recent Ebola Outbreaks
- 1918 Flu Pandemic
- SARS
- Smallpox
- Measles

R₀

Measles is preventable through two doses of a safe and effective vaccine.
New Global Anthropocene “Hot Zones” of Vaccine-Preventable & Neglected Tropical Diseases NTDs

Where political instability combines with climate change, urbanization, deforestation, or antiscience

- Texas & Gulf Coast
- Central Latin America
- Africa’s Un-Wars
- Arabian Peninsula
- China and Philippines
War, Political Collapse, Climate Change, Urbanization

• Arabian Peninsula

• Venezuela
War, Political Collapse, Climate Change, Urbanization

- Africa Un-Wars
- Texas + Gulf Coast
SHIFTING POVERTY: “Blue Marble Health”

- Neglected diseases of the poor living amidst wealth
- A new framework for global science policy and the poverty-related diseases
COVID19 and the G20 Nations

- 2-3 million cases
  - United States
  - Spain
  - Italy
  - France
  - Germany
  - UK
  - China
  - Turkey
Tissue Expression of ACE2: Heart, Lung, Adipose, Gastrointestinal Tract

SARS CoV2-COVID19 Vaccine Approaches

Vaccine Platform Technologies in Development for COVID-19

- Genetic immunization (DNA and RNA vaccines)
  - NIAID/Moderna, CureVac/NIAID, Inovio/Beijing Advaccine
- Recombinant protein
  - Baylor and collaborators
- Viral vector (ex: adenovirus)
  - Johnson & Johnson, Jenner/NIAID
- Live attenuated
  - Codagenix

Selected development programs

Diagram:
- Spike (S) protein
- SARS-CoV-2
- Cell membrane
- Transmembrane
- ACE-2
- Infection
- anti-ACE-2 antibody

Diagram:
- S1 subunit
- S2 subunit
- ACE2
- RBD
Texas Children’s Hospital Center for Vaccine Development
Texas Children’s CVD

• Low Cost

• Global Health Vaccines
  • Recombinant protein vaccines
  • Technology transfer to LMICs
  • Building vaccine development capacity in LMICs

• Our Portfolio
  • Schistosomiasis
  • Hookworm
  • Onchocerciasis
  • Leishmaniasis
  • Chagas disease
  • Coronavirus infections
    • SARS and SARS 2
    • MERS
COVID-19 in Latin America, India, Africa
Vaccine Diplomacy
Roll of Antiscience

 TEXAS WILL NOT
 THE MARK of the BEAST

 Deliver up treasonous men
 Dr. Fauci
 Bill Gates
 Mike Pompeo
 Deborah Birx
 Steve Mnuchin

 TWITTER.COM/JAMES BARRAGAN
The Rise of Antiscience
WHO and “Vaccine Hesitancy”

80,000 measles cases 2018,
>100,000 measles cases 2019
20 Years of ‘Vaccine Hesitancy’ 1998-2018

THE LANCET

RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

Summary

Background
We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods
12 children (mean age 6 years [range 1–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. In addition, endoscopy and biopsy sampling, magnetic resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.
TEXAS NON-MEDICAL VACCINE EXEMPTIONS (2003-2019)

Figure 1. Percent of Students in Kindergarten through 12th Grade with a Conscientious Exemption on file for at least one vaccine

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<tr>
<td>Exemptions</td>
<td>2,314</td>
<td>2,722</td>
<td>6,991</td>
<td>9,606</td>
<td>10,404</td>
<td>12,633</td>
<td>19,050</td>
<td>22,910</td>
<td>28,432</td>
<td>32,616</td>
<td>38,197</td>
<td>40,997</td>
<td>44,716</td>
<td>52,756</td>
<td>56,738</td>
<td>64,176</td>
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Heat map of counties with >400 kindergarteners with NMEs in 2016 to 2017

Vaccine Hesitancy in USA

The Antivax 4-Headed Monster:
1) The Media, 2) The Political Machine, 3) Deliberate Predation, 4) War on Women
Vaccine Scientist, Pediatrician, Autism Dad
Science and Public Engagement

Most Americans Cannot Name a Living Scientist

Can you name a living scientist?

- 19% Yes, I can name
- 81% No, I cannot name/Not sure

Zogby Analytics

Scientists Connect Directly with Citizens and Use New Media Tools, Too

% of AAAS scientists who do the following activities in connection with science or research findings

- Often/Occasionally
- Rarely
- Never

- Talk with citizens: 86 12 1
- Talk with reporters: 21 30 48
- Use social media: 27 20 52
- Write blog: 10 14 74

AAAS scientists survey Sept. 11-Oct. 13, 2014. Q50a-f. Social media based on combined responses to Q50e. Blog use based on combined responses to Q50a-f. Those giving no answer are not shown.

PEW RESEARCH CENTER
Epic Struggle

Mass Treatment, Vaccines & Biologicals, Vector Control Technologies

21st Century Forces
Poverty, Climate Change, War, Political Collapse, Urbanization, Antiscience